

# Work Order ID 57132

March 23, 2010 1:06:04 PM



Page 1

Item ID: D212-664-101

Accept



Setup Start



Revision ID:

Item Name: Crosstube Fwd

Stop



Start Date: 23/03/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 30/03/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan:



Date: 10-3-23 Tooling:

Date:

Run Start



QC:

Date: SPC (Y/N):

Date:

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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DOCUMENT CONTROL

Memo

Photocopy bluefile and create labels as per PPP D212-664-101 CHG003

0.00

*8 w/ b4/16*

*JG for BG 10/04/16*

Pick Kit



Packaging

Memo

0.00

*(X) a NB 10-04-16*

BENDING MACHINE - CROSSTUBES

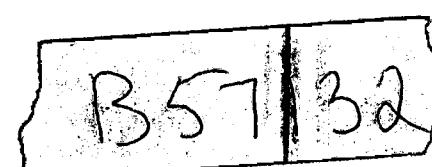
Memo

0.00

*(X) a NB 10-04-07*

CNC Alpha 160 Bender

Bend tube as per Dwg D212-664-141 using CNC bender program 212-fw and Folio FT015





W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

**Work Order ID 57132**

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Customer:

Reference:

Approvals: Process Plan: \_\_\_\_\_

Date: \_\_\_\_\_

Tooling: \_\_\_\_\_

Date: \_\_\_\_\_

Run

Start



QC: \_\_\_\_\_

Date: \_\_\_\_\_

SPC (Y/N): \_\_\_\_\_

Date: \_\_\_\_\_

Stop

Sequence ID/  
Work Center ID

130



QC

Quality Control

Operation  
Description

QC15- Crosstube Dimensional Check

Set Up/  
Run Hours

0.00

Draw  
Number

Rev.

Draw  
Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

*(S) 10/04/07*



140



Crosstubes

Crosstubes

0.00

0.00

Memo  
1-Drill pilot holes in tube as per Dwg D212-664-141 using drill Jig DT8548 & DT8549

*Jaw M*

*MP 10-04-07*

Crosstubes

2-Ream hole to finish size in tube as per Dwg D212-664-141 using drill Jig DT8548 & DT8549. Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes.

3-Scribe part # and batch # using vibrating stylus as per Dwg D212-664-141

4-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D212-664-141

*MB  
10-04-12*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_  
 Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Draw  
Number

Draw  
Rev.

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

150



HandFXtube

Hand Finishing Crosstubes

Crosstubes Chemical Conversion

0.00

Memo

0.00

*S 10/04/12*

*JK AS MB 10-04-12*

160



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00

*JK*

170



Outsource2

Outsource process - NDT

Outsource process - NDT per QSI038 4.1

0.00

Memo

0.00

Liquid Penetrant Inspection as per QSI 038  
Issue P/O: *116614*  
LPI as per ASTM 1417 Level 2  
Attach copy of NDT results to work order

*AS 10-4-13*

*11*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_  
 Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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Start Date: 23/03/2010 Start Qty: 1.00



Cust Item ID:

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Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center ID

180

Operation  
DescriptionSet Up/  
Run HoursDraw  
NumberDraw  
Rev.Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
StampReceive & Inspect for Damage & Mat'l Certs  
Packaging

0.00

Packaging

Memo

0.00

Packaging

Ensure copy of NDT results attached to work order.

*P 14/4/14 C*

190



QC

Quality Control

QC5- Inspect part completeness to step on W/O

0.00

Memo

0.00

Inspect for damage &amp; ensure results are as per Dwg D212-664-141

*M 10 04 14 O*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_  
 Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center IDOperation  
Description

200



SprayPaint

Spray Painting

Set Up/  
Run HoursDraw  
NumberDraw  
Rev.Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

Spray Painting per QSI005 4.2

0.00

SprayPaint

Memo

0.00

- 1-Prime inside and outside crosstube as per QSI 005 4.2  
2-Paint outside crosstube with White Imron as per QSI 005 4.2

PRIME:

Start Time: 9:00

Finish Time: 10:30

PAINT:

Start Time: 1:30

Finish Time: 3:45

210



QC

Quality Control

QC14- Inspect Spray Paint

0.00

Memo

0.00

Then, Wrap in plastic bag to protect from scratches

*M* 10 04 14 C1

*QC 10-04-15*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_  
 Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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**Work Order ID 57132**

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Item ID: D212-664-101

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Stop



Start Date: 23/03/2010 Start Qty: 1.00



Cust Item ID:

Required Date: 30/03/2010 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start



QC:

Date:

SPC (Y/N):

Date:

Stop

Sequence ID/  
Work Center IDOperation  
DescriptionSet Up/  
Run HoursDraw  
NumberDraw  
Rev.Plan  
CodeAccept  
QtyReject  
QtyReject  
NumberInsp.  
Stamp

220



Crosstubes

0.00

*M* 10 04 15 (1)

Crosstubes

Memo

0.00

1- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe  
 2-Install supports with magnobond as per QSI 015 Adhere for 12 Hrs  
 A/R 6398 Magnobond Batch: 114021 exp.01/2011

*SP* 10-4-16

230



QC5- Inspect part completeness to step on W/O

0.00

*S 10 04 16*

QC

Quality Control

Memo

0.00

*TC* \_\_\_\_\_

240



Pick Kit

0.00

*10-4-16 SF*

Packaging

Packaging

Memo

0.00

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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**Item ID:** D212-664-101**Accept****Setup****Start****Revision ID:****Item Name:** Crosstube Fwd**Stop****Start Date:** 23/03/2010 **Start Qty:** 1.00**Cust Item ID:****Required Date:** 30/03/2010 **Req'd Qty:** 1.00**Customer:****Reference:****Approvals:** **Process Plan:** \_\_\_\_\_**Date:** \_\_\_\_\_**Tooling:** \_\_\_\_\_**Date:** \_\_\_\_\_**Run****Start****QC:** \_\_\_\_\_**Date:** \_\_\_\_\_**SPC (Y/N):** \_\_\_\_\_**Date:** \_\_\_\_\_**Stop****Sequence ID/  
Work Center ID****Operation  
Description****Set Up/  
Run Hours****Draw  
Number****Draw  
Rev.****Plan  
Code****Accept  
Qty****Reject  
Qty****Reject  
Number****Insp.  
Stamp**

250



QC4- 100% Inspect kits for completeness

0.00

8/10/04/16

QC

**Memo**

0.00

Quality Control

260



Packaging

0.00

Packaging

**Memo**

0.00

Packaging

Identify and pack for shipping as per PPP D212-664-101

NCR

270



QC21- Final Inspection - Work Order Release

0.00

QC

**Memo**

0.00

Quality Control

10/04/16

MF

10-4-16

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_  
 Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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NOTE: Date & initial all entries

# Picklist Print

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Work Order ID: 57132



Parent Item: D212-664-101



Parent Item Name: Crosstube Fwd

Start Date: 23/03/2010

Required Date: 30/03/2010

Comments: IPP Rev:E 04.02.16 Reformat KJ/DS

Start Qty: 1.00

Required Qty: 1.00

IPP Rev:F 06-03-29 Remove Coments on Pick List JLM  
IPP Rev:G 07-04-30 As per Rev C JLM

Component Item ID/ D212-664-101TRN	Replacement	Mfg/ Manufactured	Bin	Primary No	Last	Route 110	Unit of Each	Qty on 2.0000	Remaining 1.0000	Qty 	Date B- 57147 MB ✓	Status 10-04-07
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Crosstube Turning Detail

## Warehouse Loc Qty Loc Code

### Location

Main Warehouse

LG 2

56560 1

56563 1

D3595-063-450 Manufactured No

230 Each 95.2566 4.2105

RUBBER CUSHION

## Warehouse Loc Qty Loc Code

### Location

Main Warehouse

LG 95.25657369

38959 2

43210 2.59

46465 0.3789

52447 2.72767369

53775 87.56

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_  
 Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

# Picklist Print

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**Work Order ID:** 57132



**Parent Item:** D212-664-101



**Parent Item Name:** Crosstube Fwd

**Start Date:** 23/03/2010

**Required Date:** 30/03/2010

**Comments:** IPP Rev:E 04.02.16 Reformat KJ/DS

**Start Qty:** 1.00

IPP Rev:F 06-03-29 Remove Coments on Pick List JLM  
IPP Rev:G 07-04-30 As per Rev C JLM

**Required Qty:** 1.00

Component Item ID/ MS21920-25	Replacement	Mfg/ Purchased	Bin	Primary No	Last	Route	Unit of Each	Qty on 160.0000	Remaining 4.0000	Qty	Date	Status
Clamp(per MIL-DTL-8783C)						220						

Clamp(per MIL-DTL-8783C)



## Warehouse

### Location

#### Main Warehouse

ST451	160	
108111	3	
108975	17	
109181	42	
109644	10	
113281	21	
113282	50	
<u>113744</u>	17	

W/ 10 04 15

D2893-1



Manufactured

No

220      Each      64.0000      2.0000



2.75 Support

## Warehouse

### Location

#### Main Warehouse

LG	64	
25657	6	
51775	9	
<u>53125</u>	19	
53340	10	
53774	20	

W/ 10 04 15

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_  
 Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

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Parent Item: D212-664-101



Parent Item Name: Crosstube Fwd

Comments: IPP Rev:E 04.02.16 Reformat KJ/DS

Start Date: 23/03/2010

Required Date: 30/03/2010

IPP Rev:F 06-03-29 Remove Coments on Pick List JLM  
IPP Rev:G 07-04-30 As per Rev C JLM

Start Qty: 1.00

Required Qty: 1.00

Component Item ID/ D3428-1	Replacement	Mfg/ Manufactured	Bin No	Primary	Last	Route 240	Unit of Each	Qty on 16.0000	Remaining 1.0000	Qty 10-4-10	Date SF	Status
Placard												

## Warehouse

### Location

Main Warehouse

ST056 16

55565 16

240 Each

Loc Qty

Loc Code

Purchased No

48.0000 4.0000

10-4-10 SF

## Warehouse

### Location

Main Warehouse

ST343 48

112805 18

113422 30

240 Each

Loc Qty

Loc Code

Purchased No

73.0000 4.0000

10-4-10 SF 10

## Warehouse

### Location

Main Warehouse

ST343 73

109632 1

110382 2

112314 20

113121 50

Loc Qty

Loc Code

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_  
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**Parent Item Name:** Crosstube Fwd

**Start Date:** 23/03/2010

**Required Date:** 30/03/2010

**Comments:** IPP Rev:E 04.02.16 □ Reformat □ KJ/DS

**Start Qty:** 1.00

**Required Qty:** 1.00

IPP Rev:F 06-03-29 Remove Coments on Pick List JLM

IPP Rev:G 07-04-30 As per Rev C JLM

Component Item ID/ MS21042L6	Replacement	Mfg/ Purchased	Bin No	Primary	Last	Route 240	Unit of Each	Qty on 332.0000	Remaining 6.0000	Qty	Date 10-4-16	Status sf
Nut												

## Warehouse

### Location

#### Main Warehouse

ST300 332

105077 22

110002 5

111578 305

Purchased	No	240	Each	233.0000	18.0000	6

AN960JD616

Washer

## Warehouse

### Location

#### Main Warehouse

ST347 233

112314 3

112828 1

113149 229

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_  
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NOTE: Date & initial all entries

8      7      6      5      4      3      2      1

D

Item	Qty -141	Qty -141B	Part Number	Description
1	X		D212-664-141	CROSSTUBE ASSEMBLY (205/212/412 HIGH FWD)
2		X	D212-664-141B	CROSSTUBE ASSEMBLY (214 HIGH FWD)
3	1	1	D6005-128	CROSSTUBE
4	2	2	D2893-1	SUPPORT
5	4	4	D3595-063-450	RUBBER CUSHION
6	4	4	MS21920-25	CLAMP (OR MS21920-26)
7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- 1) MATERIAL: MANUFACTURED FROM D6005-128  
FINISHED LENGTH = 126.514±0.020
- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2  
PAINT OUTSIDE PER DART QSI 005 4.2
- 3) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED.
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- 6) IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF  
USING VIBRATING STYLUS
- 7) WEIGHT: D212-664-141 = 33.6 lbs (PER IIN-D212-664)  
D212-664-141B = 33.6 lbs (PER IIN-D212-664)
- 8) PART IS SYMMETRIC ABOUT CENTERLINE.
- 9) RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY. TRANSITION SHOULD BE SMOOTH.
- 10) BEND PROGRESSIVELY WITH A MINIMUM OF 3 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- 11) LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- 12) INSTALL D2893-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2893-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 13) INSTALL MS21920-25 CLAMPS (OR -26) WITH D3595-063-450 RUBBER CUSHIONS TO SECURE THE D2893-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- 14) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

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SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 57132

2010-3-23

RELEASED  
2009-10-29  
M

D	REFORMAT/REVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -141B (ZN B4-2, D4-2); REMOVED REF & ADD TOLERANCES (ZN B4-3, C6-3, C8-3 & B6-3); RELOCATED FLAG #6 PER PAR 09-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4	RF	09.09.30
C	REMOVE -851 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	PH	07.03.08
B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	PH	00.12.12
REV.	DESCRIPTION	BY	DATE
DESIGN	<i>PH</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF		
CHECKED	<i>PP</i>	DRAWING NO.	REV. D
MFG. APPR.	<i>DA</i>	D212-664-141	SHEET 1 OF 4
APPROVED	<i>MP</i>	TITLE	SCALE
DE APPR.	<i>SH</i>	XTUBE ASSY (205/212/412 HI FWD)	NTS
DATE	09.09.30	COPYRIGHT © 2009 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL, AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

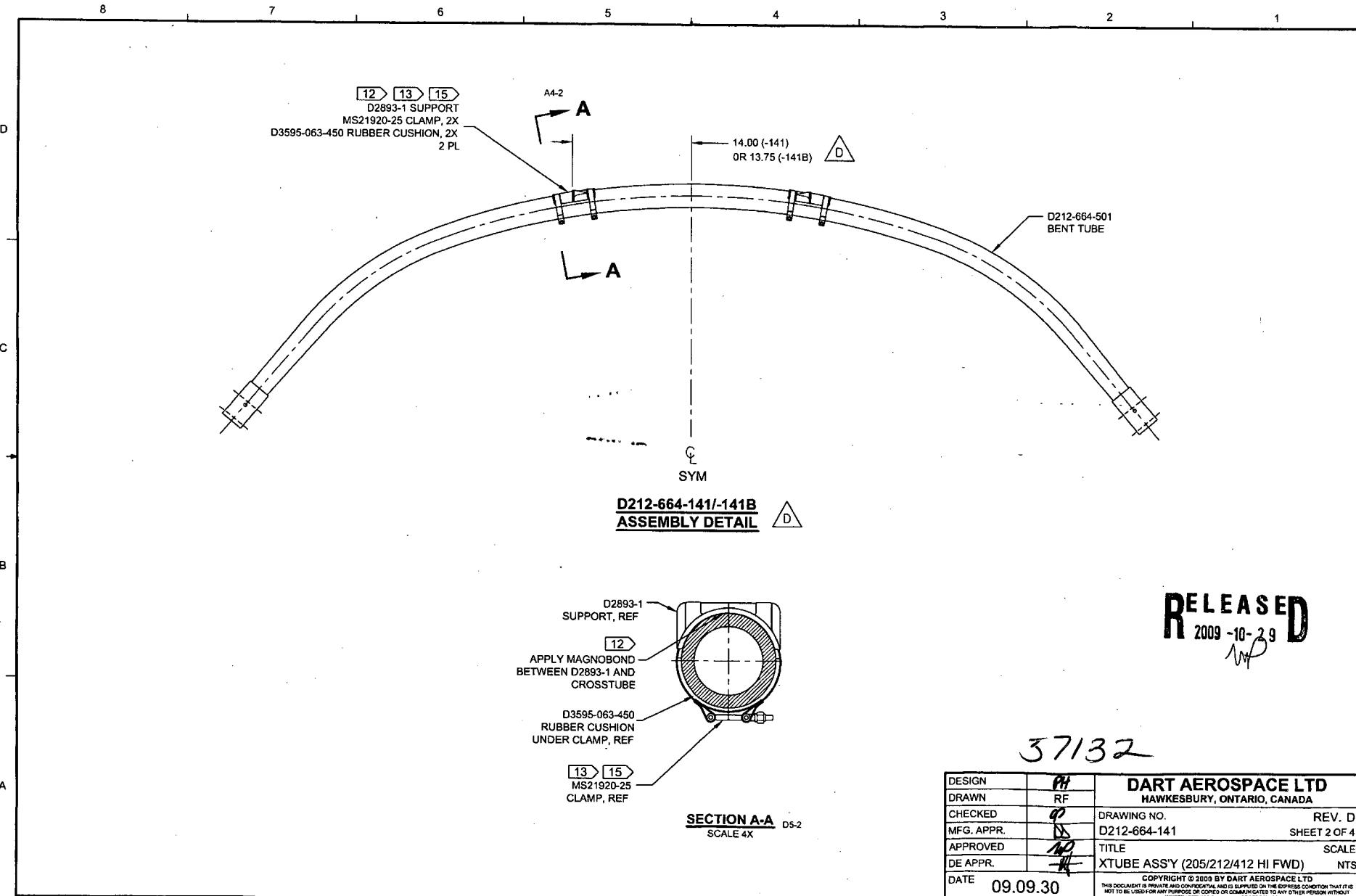
8      7      6      5      4      3      2      1

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_  
 Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries



RELEASED  
2009-10-29  
*[Handwritten signature]*

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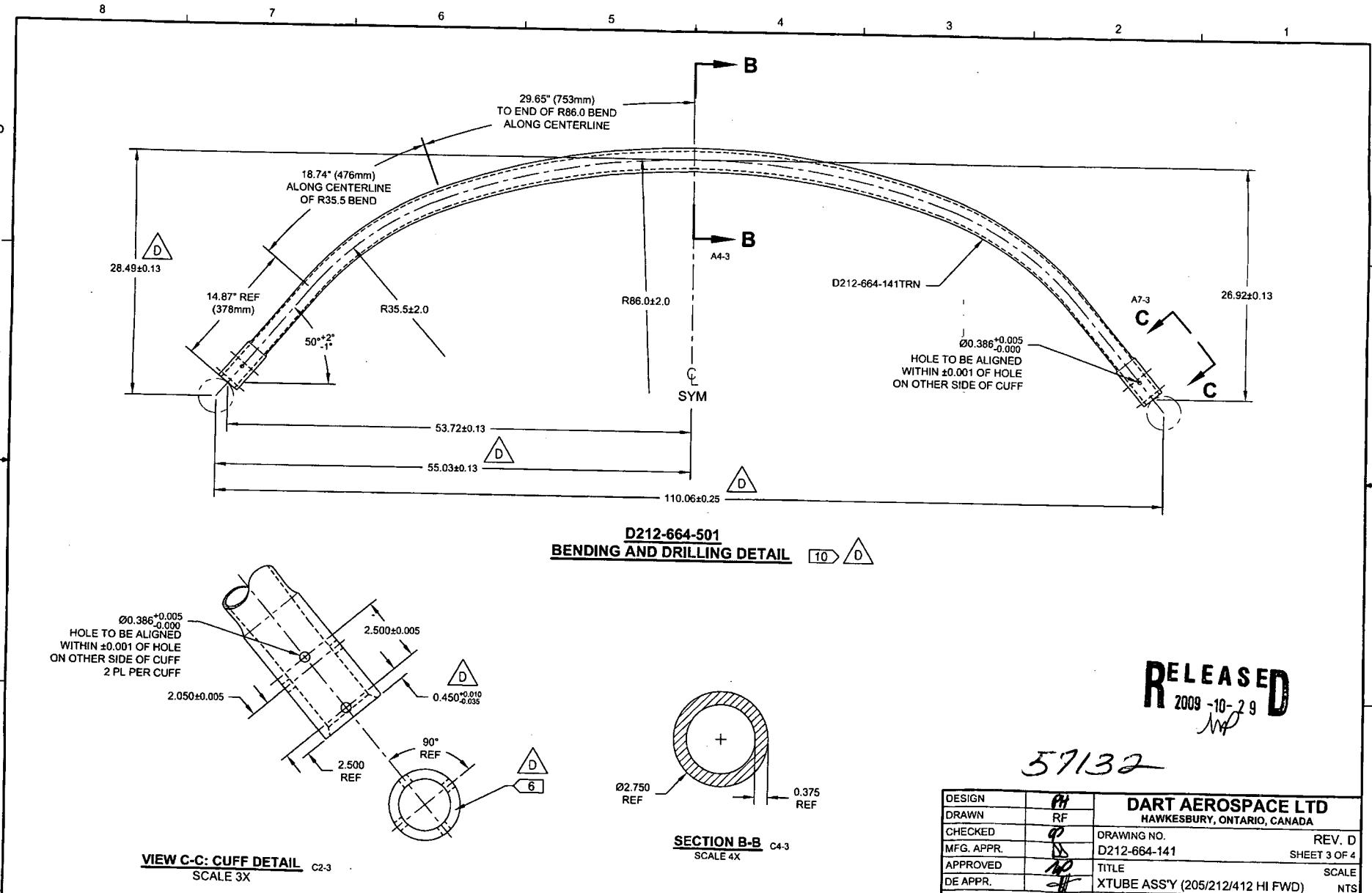
DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA
DRAWN	RF	DRAWING NO. D212-664-141
CHECKED	<i>[Signature]</i>	SHEET 2 OF 4
MFG. APPR.	<i>[Signature]</i>	TITLE
APPROVED	<i>[Signature]</i>	SCALE
DE APPR.	<i>[Signature]</i>	XTUBE ASS'Y (205/212/412 HI FWD) NTS
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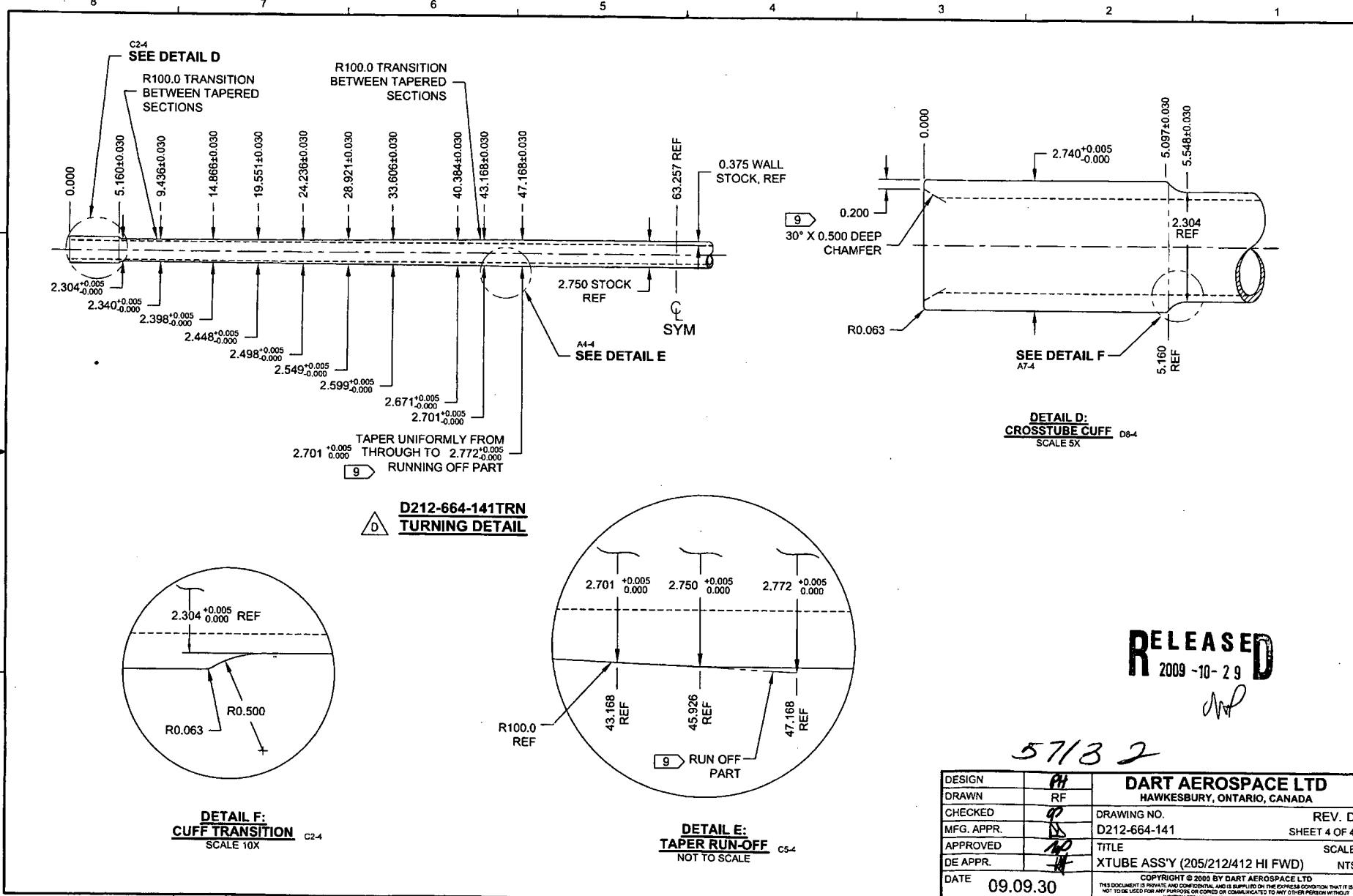
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DRAWN	RF	HAWKESBURY, ONTARIO, CANADA
CHECKED	PH	DRAWING NO.
MFG. APPR.	DA	D212-664-141
APPROVED	ND	REV. D
DE APPR.	ND	SHEET 3 OF 4
DATE	09.09.30	TITLE
		XTUBE ASSY (205/212/412 HI FWD) NTS
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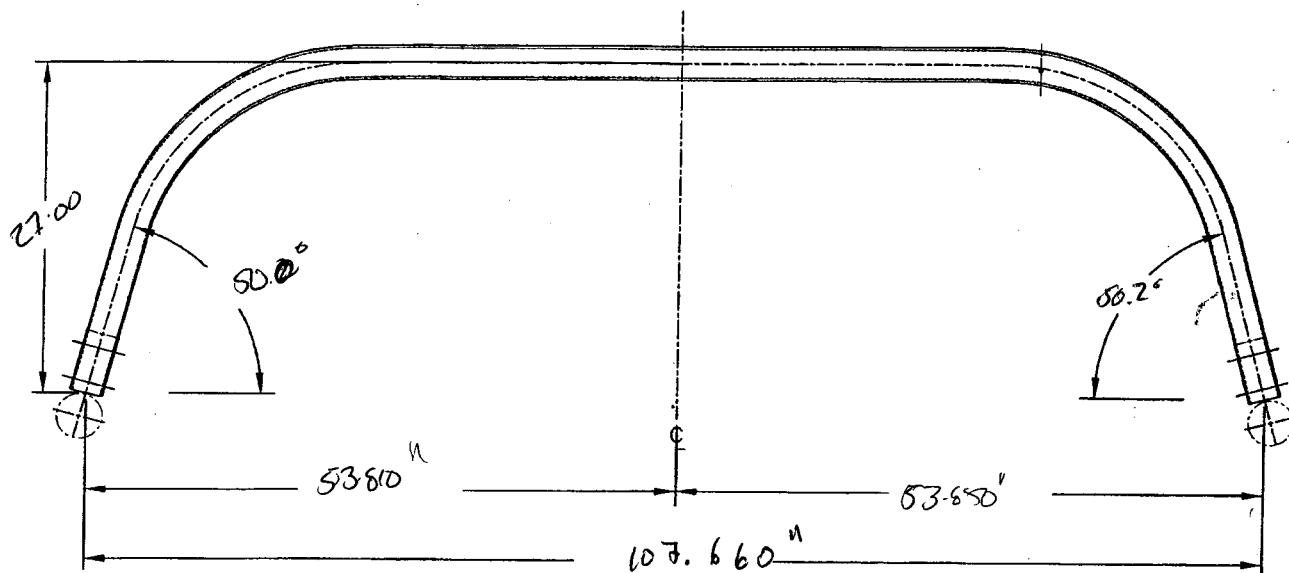
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DART AEROSPACE LTD	Work Order:	57132
Description: Crosstube High Fwd (205/212/412)	Part Number:	D212-664-101
Inspection Dwg: D212-664-141	Rev: G D 10.04.07	Page 1 of 1

Required Dimension	Min	Max
Height	26.79	27.05
1/2 Span	53.59	53.85
Angle	49	52
Total Span	107.18	107.7



Comments

QC15 Inspection	S
Date	10/04/07

Rev	Date	Change	Revised by	Approved
A	07.02.06	New Issue	KJ/JM	
B	07.05.31	Dimensions updated per Dwg Rev C	KJ/JM	JM

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Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_  
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NOTE: Date & initial all entries

ACUREN

## LIQUID PENETRANT TEST REPORT

P- 1532

CLIENT Dan Aerospace DATE April 13 - 2010 TIME AM  PI  
 ATTENTION LINDA / CHANTEL  
 ADDRESS 1270 43rd Street S.E.  
HAWKES BAY ON N6H 1K7  
 ACUREN JOB NO.  
 PO/WO NO.  
 WORK LOCATION HAWKES BAY - BUILDING  
 ACCEPTANCE STD. ASTM E1417 REV./DATE 200  
 PROJECT F.O.T. on CROSS TUBES  
 ITEM(S) EXAMINED 4 Pcs

JOB DESCRIPTION	PROCEDURE NO. LT-C002 REV./DATE	TECHNIQUE NO. LT-TCH-2 REV./DATE
PART NO.	MATERIAL <u>Aluminum</u> THICKNESS <u>—</u>	
SCOPE	<u>WET FLUORESCENT LIQUID PENETRANT</u> <u>INSPECTION CARRIED OUT 100% EXTERNAL</u>	
<b>TEST DETAILS</b>		
METHOD	<input checked="" type="checkbox"/> FLUORESCENT <input type="checkbox"/> VISIBLE	<input checked="" type="checkbox"/> WATER WASH <input type="checkbox"/> SOLVENT REMOVABLE <input type="checkbox"/> POST EMUL.
FAMILY BRAND	<u>MAGNA FLUX</u>	BLACK LIGHT S/N <u>16457</u> <input type="checkbox"/> OUTPUT > 1000 $\mu$ W/cm <sup>2</sup> <input type="checkbox"/> AMBIENT <
PENETRANT	<u>EL OT</u>	LIGHTING EQUIP. <input type="checkbox"/> FLASHLIGHT <input type="checkbox"/> TROUBLELIGHT <input type="checkbox"/> OUTPUT > 100 fc @ S
PENETRANT REMOVER	<u>H2O</u>	MINIMUM DRY TIME <u>&gt;10</u> MIN. OTHER <u>L 9.3 in. 0</u>
DEVELOPER	<u>SAC 52</u>	MINIMUM Dwell TIME <u>10</u> MIN. LIGHT METER S/N <u>1098866</u> CAL DUE DATE <u>1644 7-20</u>
DEVELOPER TYPE	<input checked="" type="checkbox"/> NON AQUEOUS <input type="checkbox"/> AQUEOUS <input type="checkbox"/> DRY	
<b>TEST SURFACE</b>		
SURFACE CONDITION	<input type="checkbox"/> AS GROUND <input type="checkbox"/> AS WELDED	<input checked="" type="checkbox"/> MACHINED <input type="checkbox"/> SHOT BLASTED
SURFACE TEMPERATURE	<input type="checkbox"/> < -4°C/ 20°F <input type="checkbox"/> -4°C/ 20°F TO 10°C/50°F	<input checked="" type="checkbox"/> 10°C/50°F TO 52°C/125°F <input type="checkbox"/> > 52°C/125°F
RESULTS-	<input type="checkbox"/> METRIC <input checked="" type="checkbox"/> IMPERIAL	

1 Cross tube-W.O. 56770 ✓1 Cross tube-W.O. 56771 ✓1 Cross tube-W.O. 57133 ✓1 Cross tube-W.O. 57134 ✓10-04-10

**Scope of Services**  
 The agreement of Acuren Group Inc. to perform services extends only to those services provided for in writing. Under no circumstances shall such services extend beyond the performance of the requested services. It is expressly understood that all descriptions, comments and expressions of opinion reflect the opinions or observations of Acuren Group Inc. based on information and assumptions supplied by the owner/operator and are not intended nor can they be construed as representations or warranties. Acuren Group Inc. is not assuming any responsibilities of the owner/operator and the owner/operator retains complete responsibility for the engineering, manufacture, repair and use decisions as to data or other information provided by Acuren Group Inc. In no event shall Acuren Group Inc.'s liability in respect of the services referred to herein exceed the amount paid for such services.

**Standard of Care**  
 In performing the services provided, Acuren Group Inc. uses the degree, care and skill ordinarily exercised under similar circumstances by others performing such services in the same or similar locality. No other warranty, express or implied, is made or intended by Acuren Group Inc.

**SIGNATURES**

CLIENT REPRESENTATIVE	<u>Matthew Murdoch</u> PRINT	<u>Matthew Murdoch</u> SIGNATURE	DTR # <u>E-27407</u>
TECHNICIAN (SIGNATURE):	<u>Mike Johnston</u>		REPORT
NAME (PRINT):	<u>Mike Johnston</u> 1 <sup>ST</sup> TECHNICIAN CGSB LEVEL <u>T</u> SNT LEVEL <u>      </u> CGSB REG. NO. <u>61606</u>	2 <sup>ND</sup> TECHNICIAN CGSB LEVEL <u>      </u> SNT LEVEL <u>      </u> CGSB REG. NO. <u>      </u>	REVIEWED BY:
			NAME <u>      </u> INIT <u>      </u>

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PTE

## 5.0 PARTS LIST

## 5.1 HIGH GEAR CROSSTUBES

Item	-101	-201	-203	Part Number	Description
	X			D212-664-101	CROSSTUBE INSTALLATION, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH FWD
		X		D212-664-201	CROSSTUBE INSTALLATION, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH AFT
			X	D412-664-203	CROSSTUBE INSTALLATION, 412 HIGH AFT
1	1			D212-664-141	CROSSTUBE ASSEMBLY, 204/205/210/212/214/412, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH FWD
2		1		D212-664-241	CROSSTUBE ASSEMBLY, 204/205/210/212/214, UH-1H, UH-1A/B/E/F/L/P, TH-1F/L, HH-1K HIGH AFT
3			1	D412-664-243	CROSSTUBE ASSEMBLY, 412 HIGH AFT
10	2			* D2893-1	SUPPORT
11	4			* D3595-063-450	RUBBER CUSHION
12	4			* MS21920-25	CLAMP (OR MS21042-26)
13	4			AN6-35A	BOLT
14	4			AN6-36A	BOLT
15	6			MS21042L6	NUT (OR MS21042-6)
16	18			AN960JD616	WASHER
20	2			* D2940-1	SUPPORT
21	4			* D3595-063-530	RUBBER CUSHION
22	4			* MS21920-28	CLAMP (OR MS21042-30)
23	4			AN6-40A	BOLT
24	2			AN6-41A	BOLT
25	6			MS21042L6	NUT (OR MS21042-6)
26	18			AN960JD616	WASHER
30		1		* D2896-1	SUPPORT
31		2		* D2856-600-1009	ABRASION STRIP
32		2		* D3595-063-570	RUBBER CUSHION
33		4		* MS21920-28	CLAMP
34		2		* MS21920-30	CLAMP (OR MS21042-32)
35		4		AN6-40A	BOLT
36		2		AN6-41A	BOLT
37		6		MS21042L6	NUT (OR MS21042-6)
38		18		AN960JD616	WASHER
39		2		* D3189-1	CHAFING SHIELD
50	1	1		-D3428-1	PLACARD

\*REFERENCE ONLY. PARTS ARE INCLUDED IN D212-664-141/-241 OR D412-664-243 ASSEMBLIES ABOVE  
 NOTE: KITS INCLUDE EXTRA HARDWARE FOR COMPATIBILITY WITH BOTH DART AND BELL/AA  
 SKIDTUBES.

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Revision: F  
 Date: 08.09.05

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